WEBINAR ANNOUNCEMENT

X-Ray Diffraction (XRD) for the Analysis of Thin Films

David Tavakoli
Research Scientist II
MCF/IEN PANalytical XRD facilities manager
School of Material Science & Engineering
Georgia Institute of Technology

Date: June 4, 2020
Time: 11:00 AM – 12:00 PM (EDT)

Abstract: XRD is a powerful technique to perform qualitative and quantitative analyses of materials and is most widely used for the identification of unknown crystalline materials. Determination of unknown solids is critical to studies in geology, environmental science, and material science to name but a few. When X-Rays contact a crystal, a series of reflections are produced that are unique and characteristic for each phase, similar to a fingerprint. It is a laboratory method that does not require large amounts of material, even very small amounts of material can be measured with special holders, and is non-destructive. Though often used as a technique to work with powders or bulk materials, this presentation will be focused on how thin films from nanometers to micrometers in thickness can be analyzed. Glancing Angle XRD is a technique to look at the chemistry and dislocation of thin films. Reflectivity is a technique that will allow us to measure the thickness of thin films, as well as its density and roughness.

Bio: David Tavakoli was born and raised in Birmingham, Alabama, though you wouldn’t believe it if you have heard his accent. He earned his B.S. in chemistry from Northland College in Ashland, WI and his M.S in Environmental Science and Engineering from Oregon Health and Sciences University in Portland, Oregon. In 2005 he came to Atlanta to work at the Centers for Disease Control where he did not work on anything biological, but worked on understanding the addictive components of tobacco. In 2012 he came to work at Georgia Tech where he primarily manages the X-Ray Diffracting (XRD) tools in the Materials Characterization Facility (MCF) in the Marcus Nanotechnology Building. His hobbies include really bad southern accents, hiking, and rock climbing.

Who should attend: Faculty, scientists, engineers, researchers, and technical staff from university, company, or government labs who use, or are interested in learning material characterization techniques with reference to XRD, in particular, as part of their research efforts.

Join the Online Event June 4th at this link: https://bluejeans.com/880565368
WEBINAR ANNOUNCEMENT

Wire-bonding Overview and Packaging Toolsets at Georgia Tech IEN

Chris White
Process Equipment Engineer - Packaging
Institute for Electronics and Nanotechnology
Packaging Research Center
Georgia Institute of Technology

Date: June 11, 2020
Time: 11:00 AM – 12:00 PM (EDT)

Abstract: The shared user labs within the Institute for Electronics and Nanotechnology at Georgia Tech include an electronics packaging toolset. A brief overview of assembly and interconnection toolsets and technologies available within IEN will be presented. A process overview on wire-bonding capabilities will also be discussed.

Bio: Mr. Chris White is currently the packaging tool support lead within the Institute for Electronics and Nanotechnology at the Georgia Institute of Technology. He received his bachelor’s degree in Electrical Engineering from Georgia Tech in 2009 and started working in the Packaging Research Center on campus to support the research labs within the center. His team currently supports the packaging toolsets within the IEN shared user labs with a primary focus on microelectronics assembly process tools.

Who should attend: Faculty, scientists, engineers, researchers, and technical staff from university, company, or government labs who use, or are interested in learning microelectronics packaging techniques with reference to wire-bong, in particular, as part of their research efforts.

Join the Online Event June 11th at this link: https://bluejeans.com/291739979
WEBINAR ANNOUNCEMENT

Fundamentals of Photomask Design

Ben Hollerbach
Process-Equipment Engineer II
Institute for Electronics and Nanotechnology
Georgia Institute of Technology

Date: June 18, 2020
Time: 11:00 AM – 12:00 PM (EDT)

Abstract: The creation of a photomask set is the first step to producing any variety of semiconductor devices. Thinking through how each mask will be used and the processing steps around them will ensure a smoother process flow and greater device yield. A brief overview of the terminology, technology, techniques around photomask design & creation, and the tools needed to evaluate and fabricate a successful photomask set will be presented.

Bio: Mr. Ben Hollerbach is a Process-Equipment Engineer at Georgia Tech’s Institute for Electronics and Nanotechnology. He started working for the IEN in 2005 while a student at Georgia Tech. After receiving his bachelor’s degree in industrial design he began working full time for the IEN and in 2009 took over the management of the IEN’s Mask Shop. Over the past 11 years Ben has managed the evolution of photomask production from the use of a 1970’s era GCA Mann Pattern Generator & Stepper through first generation Laser Writers to today’s modern Heidelberg MLA150 Maskless Aligners.

Who should attend: Faculty, scientists, engineers, researchers, and technical staff from university, company, or government labs who are interested in learning about, micro-fabrication, in particular, photomask design, as part of their research efforts.

Join the Online Event June 18th at this link: https://bluejeans.com/167443096
WEBINAR ANNOUNCEMENT

In-situ heating experiments in TEM/STEM

Mengkun Tian, Ph.D.
Research Scientist II
Institute for Electronics & Nanotechnology
Georgia Institute of Technology

Date: June 25, 2020
Time: 11:00 AM – 12:00 PM (EDT)

Abstract: In-situ heating experiment performed in the scanning/ transmission electron microscopes (STEM/TEM) allows us to directly observe the dynamic behaviors of the materials with sizes ranging from micron- to atomic level in real time. The Materials Characterization Facilities (MCF) at IEN currently has two microscopes (FEI Tecnai F30 and Hitachi HD2700) with in-situ heating capabilities. The TEM techniques including (large-scale or atomic) imaging, phase/elemental analysis and diffraction that we could perform in those facilities for in-situ heating will be introduced briefly. A few examples made by the users and manufactures will be given to show how useful the in-situ heating experiments can help us to understand the structural evolution of materials fundamentally. Finally, it will be discussed a strategy to deal with preparation of TEM samples for high temperature heating.

Bio: Dr. Mengkun Tian received his Ph.D. degree in the department of Materials Science and Engineering at University of Tennessee, Knoxville (UTK) in 2015, supervised by Prof. Duscher (UTK) and Dr.Geohegan (Oak Ridge National Laboratory). His dissertation is related to structural evolution of photocatalytic TiO₂ made by ultra-small amorphous building blocks. During 2015 and 2018, he worked as a post-doc research associate in Dr.Zawodzinski’s group at UTK to fabricate and investigate the corrosion resistant cathode materials for solid acid fuel cell. He was a visiting scientist at Oak Ridge National Laboratory from 2011 to 2018. He joined Georgia Tech as a post-doc in May, 2018 and was promoted to research scientist II last October. His current research interests include in-situ corrosion testing on metals, electron beam induced phase transformation, and phase transformation of high entropy alloys.

Who should attend: Faculty, scientists, engineers, researchers, and technical staff from university, company, or government labs who use, or are interested in learning about material characterization toolset, in particular, SEM/TEM as part of their research efforts.

Join the Online Event June 25th at this link: https://bluejeans.com/949737327